

**Amendments to the Drawings:**

Please replace original sheets 1/3 - 3/3 with the enclosed Replacement Sheets 1/4 - 3/4, respectively, and please add the enclosed New Sheet 4/4. No new matter is included or added. The attached four sheets of drawing contain amendments as follows:

Replacement Sheet 1/4 includes Fig. 1, which has been amended to show system 29 forming an intermediate image.

Replacement Sheet 2/4 includes Figs. 2 and 3, which have not been amended. However, the sheet itself has been renumbered from "2/3" to "2/4".

Replacement Sheet 3/4 includes Figs. 4, 5, and 6, which have not been amended. However, the sheet itself has been renumbered from "3/3" to "3/4".

New Sheet 4/4 includes added Figs. 7A through 7D, which have been included in the specification to eliminate improper incorporation by reference of Naumann/Schröder, "Bauelemente der Optik" [Optical components], Taschenbuch der technischen Optik, 5th ed., page 162, in which the added figures appear.

Attachments: Replacement Sheets 1/4 - 3/4 (replace original sheets 1/3 - 3/3)  
New Sheet 4/4

## **REMARKS**

### ***Drawings***

The objection to the drawings is respectfully overcome by adding a system 29 forming an intermediate image in Fig. 1, and by adding corresponding description to the specification. Such a system is mentioned in the paragraph starting at page 4, line 12 of the translated international application. Claim 25 has been amended in accordance with the originally disclosed subject matter. No new matter has been added. Removal of the objection is respectfully requested.

New drawing sheet 4/4 is added to insert figures appearing in Naumann/Schröder, "Bauelemente der Optik" [Optical components], Taschenbuch der technischen Optik, 5th ed., page 162, in order to correct improper incorporation by reference. No new matter has been added.

### ***Specification***

A Substitute Specification (marked and unmarked versions) is submitted herewith to provide section headlines and insert subject matter improperly incorporated by reference in the original specification. The Substitute Specification contains no new matter.

Subject matter appearing in Naumann/Schröder, "Bauelemente der Optik" [Optical components], Taschenbuch der technischen Optik, 5th ed., page 162, is inserted at paragraph [0038] of the specification. **Statement Under 37 CFR 1.57(f): The material being inserted, including new Figs. 7A-7D, is the material previously incorporated by reference and the amendment contains no new matter. A copy of this page from the original text, together with an English language translation thereof, are enclosed for the record.**

Entry of the Substitute Specification and removal of the objections to the specification is respectfully sought.

### ***Claim Amendments***

Claim 12 is amended to include all the limitations of dependent claim 20 and intervening claims 17 and 15.

Claims 16, 18, and 23 are amended to depend from amended claim 12.

Claims 19 and 21 are rewritten in independent form with no change in scope.

Claim 25 is amended to conform the claimed subject matter to the specification.

***Claim Rejections - 35 USC § 102***

The rejection of claims 12-13 and 15 under 35 USC 102(b) as being anticipated by US 6097538 (Watanabe et al.) is overcome by amending claim 12 to include all the limitations of claim 20 and intervening claims 17 and 15. Accordingly, claim 12 is now thought to be in condition for allowance. Removal of the rejection of claims 12 and 13 is respectfully requested. The rejection is moot as to claim 15, which is canceled.

The rejection of claims 12-15 under 35 USC 102(b) as being anticipated by US 3459464 (Smith) is overcome by amending claim 12 to include all the limitations of claim 20 and intervening claims 17 and 15. Accordingly, claim 12 is now thought to be in condition for allowance. Removal of the rejection of claims 12-14 is respectfully requested. The rejection is moot as to claim 15, which is canceled.

***Claim Rejections - 35 USC § 103***

Claims 12-18, 23 and 25 are rejected under 35 USC 103(a) as being unpatentable over EP 1120676 (Nakamura) in view of US 4576450 (Westphal). This rejection is respectfully overcome by amendment of parent claim 12 to match the scope of original claim 20, deemed to be allowable subject matter. Favorable treatment of claims 12-14, 16, 18, 23, and 25 is respectfully requested. The rejection is moot as to claims 15 and 17, which are canceled.

Claim 24 is rejected under 35 USC 103(a) as being unpatentable over Nakamura in view of Westphal, in further view of US 4175826 (Blaha et al.). claim 24 depends from claim 23, which is allowable as indicated above. Favorable reconsideration of claim 24 is kindly requested.

***Allowable Subject Matter***

The indication of allowable subject matter in claims 19-22 is acknowledged with thanks. Applicant has amended claim 12 to be of the same scope as original claim 20, now cancelled.

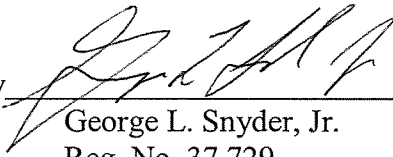
Claims 19 and 21 are rewritten in independent form to overcome objection. Allowance of claims 19 and 21 is respectfully requested.

***Conclusion***

The present application is now thought to be in condition for allowance, which action is respectfully requested. If the Examiner has any questions, or the attorneys for applicant can assist in any way, the undersigned attorney may be contacted at the number provided below.

Appl. No. 10/536,602  
Amendment and Response to Office Action  
Reply to Office Action of August 7, 2006

Respectfully submitted,  
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unabhängig vom Einfallswinkel  $\epsilon$ . Dreht man also das Pentagonprisma b) um eine Achse senkrecht zur Zeichenebene, so bleibt die Ablenkung um  $\delta$  erhalten!

Geht man von a) und b) auf 3, 4, ... Spiegelungen über, so gilt als allgemeiner Satz: Der Ablenkungswinkel  $\delta$  ist von einer Drehung des Gesamtsystems um eine Achse senkrecht zur Einfallsebene abhängig (unabhängig), wenn eine ungerade (gerade) Anzahl komplanarer Spiegelungen benutzt wird.

Die Bildlage wird mit einem „L“ als Objektsymbol untersucht (langer y-Balken in der Knickebene = Zeichenebene = y-z-Ebene, kurzer x-Balken senkrecht in die Zeichenebene hinein zeigend, d. h. die x-z-Ebene festlegend. Diese L-Symbole sind perspektivisch, die Prismen aber im Schnitt dargestellt!

Die Bildlage  $x', y'$  bei a) zeigt, daß eine Spiegelung zu einseitiger Bildumkehrung führt (hier y-Umkehrung  $L \rightarrow \Gamma$ , also Klappung um x-Achse). Hingegen ergibt sich bei b), also zwei Spiegelungen, keine Bildumkehr,  $L \rightarrow L$ . Man findet die y-Richtung leicht mit einem Parallelstrahl (bei Bild 5.7.1 a gestrichelt), oder noch schneller „experimentell“ durch Umlappen z. B. eines Bleistifts an den Spiegelflächen! Die x-Richtung bleibt bei a) und b) ungeändert.

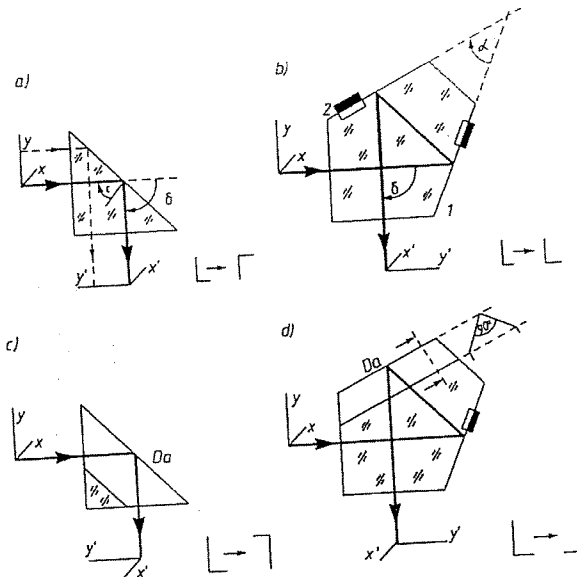


Bild 5.7.1 Grundlagen der Reflexionsprismen am Beispiel der 90°-Richtungsänderung  
a) Halbwürfelprisma, b) Pentagonprisma, c) Halbwürfelprisma mit Dachkante Da, d) Pentagonprisma mit Dachkante

... independently of the angle of incidence  $\varepsilon$ . If the pentagonal prism b) is therefore rotated about an axis perpendicular to the drawing plane, the deflection about  $\delta$  is retained.

Proceeding from a) and b) to 3, 4, etc. reflections, the following general principle applies: The deflection angle  $\delta$  is dependent on (independent of) a rotation of the overall system about an axis perpendicular to the plane of incidence when an odd (even) number of coplanar reflections is used.

The *image position* is investigated using an "L" as the object symbol (long Y limb in the folding plane = drawing plane = Y-Z plane; short X limb pointing perpendicularly into the drawing plane, i.e. defining the X-Z plane). These "L" symbols are depicted in perspective, but the prisms are shown in section.

The image position  $x', y'$  in a) shows that *one reflection* results in *one-sided image reversal* (here a Y reversal  $L \rightarrow \Gamma$ , i.e. flipping about the X axis). In b), however, i.e. two reflections, there is no image reversal ( $L \rightarrow L$ ). The Y direction can easily be found using a parallel beam (dashed line in Fig. 5.7.1.a), or even more quickly "by experiment" by rotating a pencil, for example, against the mirror surfaces. The X direction remains unchanged in a) and b).

Fig. 5.7.1 Fundamentals of reflective prisms, using the example of a  $90^\circ$  change in direction

a) Half-cube prism, b) Pentagonal prism, c) Half-cube prism with roof edge Da, d) Pentagonal prism with roof edge.